Space Weather Forecast

Issued on Monday, 13 March 2023 at 13:44 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Minor Geomagnetic Storm intervals from late on day 2 (14th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only isolated Common class flares. The strongest of which was associated with a filament (arcs of plasma held together by the Sun's magnetic field) eruption at 13/1105 UTC near centre disc in the northern hemisphere. There are currently eight numbered sunspot regions on the visible disc. Most of the regions on the disc are unipolar and have shown little change. There is only one bipolar region, near centre disc, however it is small, magnetically simple and has shown signs of decay during the period.
A filament eruption was observed on the southeast disc late on the 12th, with the associated Coronal Mass Ejection (CME) observed in imagery off the south-centre disc. This CME has been analysed and may produce a glancing blow at Earth later on the 15th into the 16th. Any CME associated with the filament eruption mentioned above at 13/1105 UTC will need to be analysed as imagery becomes available to determine whether it is Earth directed, but it is possible due to the location of the eruption.
At 13/0336 UTC a fast full halo CME can be seen emerging on imagery. This event has been determined as far sided and not Earth directed.

Solar Wind / Geomagnetic Activity: The solar wind has been slow during the past 24 hours, ranging between 320 and 380 Km/s. The total magnetic field strength has been weak, with no significant deflections in the north-south component. Geomagnetic activity was Quiet to Unsettled (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles increased from 13/0500 UTC in response to the large far sided CME, temporality reaching the S1 minor storm level, before soon declining to slightly elevated levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is generally expected to be Low or Very Low, with isolated Common-class flares. There is a very slight chance of Moderate-flares.

Solar Wind / Geomagnetic Activity: Glancing CME impacts are possible from late on day 2 (14th) due to two filament eruptions that occurred on the 10th and 12th. Otherwise, slow solar winds are likely to become slightly elevated on day 3 (15th) due to the arrival of a positive coronal hole fast wind.
Geomagnetic activity is likely to be mostly Quiet with isolated Unsettled intervals (Kp 0-3) on days 1 and 2 (13th and 14th), increasing to Unsettled, with occasional Active intervals by Day 3 (15th). There is a slight chance of G1/Minor Geomagnetic storm intervals from late on day 2 (14th) due to the possible glancing CME impacts.

Energetic Particles / Solar Radiation: The count rate of energetic particles is currently slightly elevated, but is expected to decline to background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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